

AD-A253 201



DTIC
ELECTE
JUL 29 1992
S C D

2

Improving the USAF Technology Transfer Process

William C. Martel, Donald Putnam Henry, C. R. Neu

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

92-20335



92 7 27 251

RAND

PROJECT AIR FORCE

The research reported here was sponsored by the United States Air Force under Contract F49620-86-C-0008. Further information may be obtained from the Long Range Planning and Doctrine Division, Directorate of Plans, Hq USAF.

Library of Congress Cataloging in Publication Data

Martel, William C.

Improving the USAF technology transfer process / William C. Martel, Donald Putnam Henry, C.R. Neu ; prepared for the United States Air Force.

p. cm.

"R-4081-AF."

ISBN 0-8330-1152-9

1. United States. Air Force—Management. 2. Technology transfer—Government policy—United States. I. Henry, Donald Putnam, 1957— II. Neu, C. R. (Carl Richard), 1949— III. United States. Air Force. IV. Title.

UG773.M37 1991

358.4'07'0973—dc20

91-18364

CIP

The RAND Publication Series: The Report is the principal publication documenting and transmitting RAND's major research findings and final research results. The RAND Note reports other outputs of sponsored research for general distribution. Publications of RAND do not necessarily reflect the opinions or policies of the sponsors of RAND research.

Published 1991 by RAND

1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

R-4081-AF

Improving the USAF Technology Transfer Process

William C. Martel, Donald Putnam Henry, C. R. Neu

A Project AIR FORCE Report
prepared for the
United States Air Force

Accession For		
NTIS GRA&I	<input checked="" type="checkbox"/>	
DTIC TAB	<input type="checkbox"/>	
Unannounced	<input type="checkbox"/>	
Justification		
By		
Distribution/		
Availability Codes		
Avail and/or		
Dist	Special	
A-1		

RAND

DTIC QUALITY INSPECTED 2

PREFACE

This report examines a range of issues that were briefed to the Security Assistance Management Improvements Working Group (SAMIWG) in the U.S. Air Force. It outlines research on the technology transfer process, provides some observations on the coordination process and the role of the Air Force in technology transfer cases, identifies several problems, and concludes with several proposals for solving them.

This work was performed at the request of Brigadier General Philip W. Nuber (USAF), Director of International Programs (AF/PRI) and the Air Force Center for International Programs (AFCIP). In the spring of 1990, General Nuber asked RAND to assist the SAMIWG in recommending a range of options for improving the efficiency of Air Force security assistance programs. The Working Group is also charged with responding to a series of issues relating to security assistance that were raised by the Office of the Secretary of Defense (OSD) in the Defense Management Review (DMR) and others raised within the Air Force. RAND was asked to provide an independent view of the technology transfer process within the USAF and to propose ways for improving the process.

Subsequent to the completion of the research in this document, the Directorate of International Programs, (AF/PRI) was transferred to the Air Force Secretariat under the Deputy Under Secretary for International Affairs. Rather than changing the names of the offices described in this report and trying to predict the behavior of the organizations in the new structure, we offer our observations of the technology transfer process during the time the research was conducted. We believe that many of the basic characteristics of that process remain the same and that the report's conclusions are therefore still relevant.

This document should be of interest to members of the defense community who are concerned with technology transfer and, more broadly, with the nature of the Air Force organization as it adapts to the new demands and reduced resources. The work was performed under the auspices of the National Security Studies Program of RAND's Project AIR FORCE.

SUMMARY

THE AIR FORCE AND TECHNOLOGY TRANSFER

The transfer of technology is an integral part of many USAF security assistance programs that train and equip foreign military forces. The USAF comments on security assistance programs proposed by the other services and advises policymakers on commercial sales of weapons systems and dual-use technologies. It also engages in cooperative research and development projects with other nations.

Some observers in the USAF believe that it has little influence on the technology transfer process and more broadly that its concerns are routinely ignored. As the pool of USAF personnel shrinks over the next several years, ways must be found to increase the efficiency and reduce the workload of USAF personnel involved in technology transfer. We present ideas to increase both the external persuasiveness and internal efficiency of the USAF in technology transfer cases.

USAF ROLES IN THE POLICY PROCESS

The USAF role in technology transfer issues is to support policymakers. It normally does not make decisions about technology transfer cases but advises those who do.

Other institutions, including the State Department and the Commerce Department, also offer political and economic advice. Policymakers balance USAF concerns with those of other departments, agencies, and interest groups.

The USAF, however, is the best source of advice on the effect of technology transfer on the Air Force's ability to conduct military operations in a theater.

PROBLEMS AND IDEAS

Delays in the Coordination Process

The USAF's internal coordination process hinders its ability to respond to technology transfer cases. Although that process assures the involvement of all offices, including those that are marginally or only occasionally interested, the result is a cumbersome and lengthy process.

We recommend establishing a deadline for responding to a case.¹ Reporting agreement should not be required: If an office has no objections, it should not have to respond and thereby impose a delay. Varying levels of dissent could usefully be built into the coordination process. These might range from mild dissent to identification of serious objections that could stop or delay the process until they are resolved. Case managers could accept or ignore lesser objections. The net effect should be to speed up the coordination process and reduce the resources necessary to staff it.

Inhibitions on Dissent

The USAF expends a good deal of effort eliminating dissent in the coordination process. This means that it spends time identifying objections in technology transfer cases and then systematically eliminating or resolving them using the Air Force's own criteria to arrive at a unified position. The price for unanimity is wasted effort, especially when the USAF does not have a large stake in the decision or when it lacks the authority to make a decision. The Air Force often acts as though it is making a command decision when its role in fact is to provide advice.

The elimination of dissent increases the workload and diminishes the quality of the advice that the USAF provides to outside policymakers. Policymakers prefer descriptions of the advantages and disadvantages of various options. The USAF, however, produces one position and expounds only the advantages that support it. If policymakers perceive that USAF advice is often not particularly valuable to them, they will ignore USAF advice even when it has useful insights. USAF credibility is undermined if policymakers have difficulty distinguishing between strong and weak USAF positions.

Rather than eliminating dissent from the process, the USAF should present competing options and justifications for each case. Moreover, the USAF should express an organizational position on the preferred course of action only in cases that involve truly important interests.

¹Almost any issue might be sent through the coordination process. Here we use the term "case" to mean a document recommending the release or disclosure of information to a foreign government or international organization.

Failure to Anticipate Broader Concerns

The USAF is only one organization within the government with an interest in technology transfer. Cases that pass through the USAF often are killed or returned because the USAF did not address broader, if predictable, concerns. This forces the USAF to spend time reworking the case.

If case managers informally coordinate with offices outside the USAF, they can anticipate these broader concerns, saving time and effort.

Identifying Controversial Cases

Many technology transfer cases considered by the USAF are noncontroversial. Others, however, involve extremely controversial issues that require a good deal of work and thought. Unfortunately, case managers often do not have the information necessary to sort out the controversial from the noncontroversial issues and spend time on noncontroversial cases or on noncontroversial aspects of controversial cases. Case managers could be more efficient if they had access to tools that identify controversial issues.

Inadequate Information

The more experienced case managers possess detailed knowledge or sources to which they can turn, but this is not true of inexperienced personnel. All USAF case managers would work more efficiently if they had access to better information. Some examples include a file containing the history of all requests by country and item (a "precedents" file), files of potential problems and solutions, and organization charts.

Suboptimal Organization

USAF expertise in technology transfer cases is essentially operational and technical, relating primarily to weapon systems rather than nations or regions. However, USAF security assistance components in the International Programs Directorate (AF/PRI) are organized by nation and region rather than by weapon system. Given that country or region expertise is widely replicated elsewhere (in the USAF, OSD, JCS, State Department, and National Security Council), one option is to reorganize AF/PRI primarily by weapon systems while retaining some minor degree of regional organization for dealing with clients.

viii

This change might increase USAF effectiveness in dealing with technology transfer issues as well as other aspects of security assistance cases.

ACKNOWLEDGMENTS

Within the U.S. Air Force, thanks are due to numerous people in the regional divisions in the Directorate of International Programs and to individuals in the Office of the Secretary of the Air Force. Individuals in the Office of the Secretary of Defense, including the Defense Security Assistance Agency and Defense Technology Security Administration, also helped us understand the process and substance of technology transfer. We are grateful to individuals in the State Department, Commerce Department, and the National Security Council for their time and expertise. Finally internal RAND reviewers, Bruce Nardulli and John Setear provided valuable comments on an earlier draft. We alone are responsible for the content of this research, however, and any observations or conclusions that follow.

CONTENTS

PREFACE	iii
SUMMARY	v
ACKNOWLEDGMENTS	ix
Section	
1. INTRODUCTION	1
Project Background	1
Research Objectives	2
Defining Technology Transfer	2
2. USAF ROLES IN THE POLICY PROCESS	4
USAF Supports Policymakers	4
USAF Expertise One Component of Decision	4
USAF Has Unique Technical Expertise	4
Alternative Technology Transfer Paths Through USAF	5
3. UNDERSTANDING THE COORDINATION PROCESS	7
Formulating Air Force Positions	7
Creating Unanimity	8
4. PROBLEMS AND IDEAS	11
Delays in the Coordination Process	11
Inhibitions on Dissent	13
Failure to Anticipate Broader Concerns	16
Identifying Controversial Cases	17
General Solutions	19

1. INTRODUCTION

PROJECT BACKGROUND

Technology transfer issues are raised when a foreign government or international organization asks for equipment or training from the USAF.¹ Such issues can also arise in other military departments and through channels other than security assistance.² This report suggests ways in which the process of resolving technology transfer issues might be improved at a time when the USAF is adapting to a rapidly evolving security environment. A corollary of this research is better understanding of USAF interaction with other government agencies involved in technology transfer cases.

Increased efficiency in managing technology transfer cases and greater effectiveness in communicating USAF views to policymakers outside of the Air Force are important for several reasons. Ultimately, these relate to the changing global climate within which technology transfer decisions are made. In the waning days of the Cold War, all of the military departments, including the Air Force, face an imminent decline in their budgets and a simultaneous shrinkage of the personnel pool. The United States and the military departments are unlikely to see any reductions in the global demand for weapon systems, particularly for the advanced, high-technology components in which the United States has a clear advantage. Security assistance may somewhat reduce the need for U.S. forces in regional conflicts. For example, bolstering the defensive capabilities of the Gulf Cooperation Council states may greatly reduce the likelihood and size of future U.S. intervention in the region.

¹This research on technology transfer for the USAF falls under the broad heading of security assistance because many of the technology transfer cases originate in a request by a country to purchase U.S. items through security assistance. Broadly speaking, security assistance refers to transfers from the United States to foreign governments of military equipment, training, and support. These transfers may be on a cash basis, they may involve credit, and they may have an aid component. Some international arms sales appear to have all the key characteristics of security assistance but are not formally part of the process. The best example is military equipment produced by an American manufacturer, which would be "security assistance" if the U.S. government sold it to a foreign nation but not when the manufacturer sells directly to a foreign government. It then becomes a direct commercial sale. The State Department licenses direct commercial sales of military equipment and is the lead staff agency in such transactions.

²Some of these other channels, which also may involve the Air Force, are described in Sec. 2.

The Air Force will want strict controls on the release of technology to other nations. The USAF will want to continue to protect and maintain the operational advantages that the United States enjoys by virtue of the advanced technologies incorporated in American weapon systems. U.S. forces will depend on this advantage, among others, in the event of combat. The United States also can continue to use foreign demand for high-technology weapons as a source of some political and economic influence in moderating the actions of other states.

There are times when the USAF's chief security concerns will conflict with economic concerns about commercial competitiveness and the export of technologies. Although security implications of technology transfers have seldom been clear-cut, the USAF will in the future be managing cases that require balancing security and economic concerns and cases with conflicting economic concerns. For example, allowing the transfer of a technology embodied in a weapon system might generate sales and increase exports in the near term. Over the longer horizon, transferring the technology may enable competing economic powers to use the technology for their commercial exports, ultimately harming U.S. commercial interests.

RESEARCH OBJECTIVES

This research aims to improve the efficiency of the USAF case managers who are tasked with managing security assistance "cases" involving transfers of technology. A corollary of that goal is to help streamline the technology transfer process throughout the Air Force as a whole.

Another objective is to suggest ways in which the Air Force might increase the persuasiveness and usefulness of the positions it takes and the information it provides to the rest of the U.S. government on technology transfer cases. We have observed that advice offered by the Air Force often is viewed within other government agencies as uninformative and only marginally constructive, and the Air Force perceives the rest of the government ignores its opinions on technology transfer issues.

DEFINING TECHNOLOGY TRANSFER

"Technology transfer" is a catch-all phrase seldom used with any degree of precision or consistency by organizations or individuals responsible for it. Although this research does not depend on any particular definition of technology transfer—it focuses on the process

through which decisions are made rather than the content of the decisions themselves—it is useful to understand what the term means.

The term “technology transfer” has two broad meanings in the U.S. government. The USAF typically uses the term to designate the act of providing specific operational capabilities in the form of equipment or technical “know-how” to another country.³ It is not necessary for the recipient to understand how the equipment works or even in some cases to have the necessary technical skill to build or repair it. The military services’ overriding concern is the implications of most proposed transfers of technology for USAF operational capabilities.

To most of the rest of the government, technology transfer is the development of production capabilities or any of the specialized knowledge that a foreign government or enterprise would need to build the item. In this connotation, “technology transfer” usually refers to production technologies that are necessary to create specific production technologies (e.g., how to build an F-16) and military or civilian knowledge in general about production processes (e.g., how to build an aircraft or key components thereof).

³The USAF commonly uses the term “releasability” when it refers to the disclosure of information about USAF weapon systems or the knowledge that would allow the recipient to build it or develop countermeasures. Its counterpart in the government, the National Disclosure Policy Committee, focuses on the levels of classified information that can be disclosed to foreign governments.

2. USAF ROLES IN THE POLICY PROCESS

USAF SUPPORTS POLICYMAKERS

Broadly speaking, the Air Force role is to support policymakers in other U.S. government agencies who are charged with judging whether it is prudent and wise for a particular technology to be released. The Air Force can support policymakers in two ways. The first and most important is that the Air Force is a source of expertise on the operational implications for U.S. forces of any proposed transfer of technology. It is responsible for explaining how, if at all, the technology will affect the ability of U.S. or allied air forces to operate in a theater. The second and more prosaic function is managerial. The Air Force provides the original staff work for technology transfer cases that involve USAF equipment, technical information, and training and therefore originate within the USAF security assistance program.

By contrast, the USAF does not normally make decisions about technology transfer. Its role is to advise policymakers who are usually not part of the Air Force. We raise this point because it often appeared during the course of our research that Air Force staff officers and civilian personnel acted as though they were charged with making a decision rather than providing advice.

USAF EXPERTISE ONE COMPONENT OF DECISION

Although the Air Force provides important expertise on the operational implications of a technology transfer case, this is only one dimension of the problem. Other important considerations include bilateral political, intelligence, and economic factors, falling outside the expertise of the Air Force. Policymakers commonly turn to other institutions for advice and expertise about the array of concerns that are beyond the purview of the USAF. The Air Force, then, must realize that it is not the only organization that can speak authoritatively about the implications of technology transfer, for its voice is only one among many views on any given issue.

USAF HAS UNIQUE TECHNICAL EXPERTISE

Even though the Air Force provides only part of the expertise that policymakers need, it is a unique repository of technical know-how.

The Air Force, like the other military departments, has an unparalleled ability to address how a proposed transfer of technology is likely to affect the ability of U.S. or allied air forces to operate in a theater. In the case of the sale of AWACS aircraft to Saudi Arabia in the 1980s, only the Air Force was able to render an authoritative judgment on how the proposed sale would affect the ability of U.S. aircraft to operate in the Persian Gulf.

In addition, the Air Force has access to a vast repository of technological information in its research and development laboratories not replicated elsewhere in the government. This provides a wealth of expertise from which the USAF can draw to make judgments about the operational implications of a transfer of technology.

ALTERNATIVE TECHNOLOGY TRANSFER PATHS THROUGH USAF

Technology transfer requests do not follow a uniform path through either the Air Force or the government. Similar requests for the release of a technology can be brought to the attention of the Air Force in various ways.

Many cases follow the formal process that begins when a foreign government asks to buy an item in the Air Force inventory. In a typical case, several offices in the USAF are asked for their views on the merits of a security assistance case that involves the transfer or release of technology.¹ The majority of technology transfer issues that come to the attention of the USAF are in the security assistance arena, but some cases fall outside the security assistance process.

The Air Force can become involved in technology transfer in other ways as well. The Air Force will normally be asked for its views on security assistance cases another military department is handling if the transfer of technologies could potentially affect USAF ability to operate in a theater. Another example is munitions license requests processed through the State Department. These originate when a foreign government makes a formal request to buy a weapon system in the USAF inventory directly from the contractor that manufactures the item, known as a direct commercial sale. The Air Force also may be asked to comment on license applications for dual-use exports, which are technologies or goods that can have civilian and military applications and are made through the Commerce Department or State Department. Finally, the Air Force may become involved in re-

¹See Sec. 3 for an overview of the coordination process.

quests that involve cooperative research, development, or production programs with other nations.

Each of these types of transactions has a different point of entry into the USAF and a different set of offices in the USAF that will be called upon to judge the merits of a proposed release of technology. The risk for the USAF is that, in the absence of a systemic arrangement for review of technology transfer cases, it will not articulate its judgments to the advantage of the policymakers that need them. We believe that such a system currently exists and that any proposals for change must rest on using the system more effectively.

3. UNDERSTANDING THE COORDINATION PROCESS

To understand how shortcomings in the Air Force coordination process confound the ability of the USAF to provide useful and persuasive advice to policymakers as efficiently as possible on technology transfer cases, it is useful to review how the process actually works. Below we outline the major features of the USAF procedures for achieving a consensus on an issue.

FORMULATING AIR FORCE POSITIONS

The coordination process provides the formal means and the associated informal "etiquette" by which the Air Force arrives at a "position" about a proposed transfer of technology.¹ We believe that the nature of the coordination process itself affects the quality of the advice that the Air Force provides to senior government policymakers.

Junior officers or civilians within the Air Staff initiate virtually all of the work for an Air Force position. The case managers begin by "writing" the case, collecting papers and positions from various offices. Eventually they become the factual basis on which the Chief of Staff or Vice Chief of Staff of the Air Force makes a judgment about the merits of the case. When the case manager has collected the positions, he prepares a formal memorandum for the Chief of Staff or other designated official.

Before an issue reaches the Chief of Staff, however, it will have traversed several offices in the USAF organization.²

¹ The coordination process is defined as the "process of securing unity of effort in developing a policy or course of action. It is the interaction between two or more functional areas to ensure that the interest of each area is considered in the development of a proposed course of action. It involves study, discussion and resolution of differences, and may be provided through participation in air staff boards and committees or through normal staff actions and the communication between individuals at any organization level." Headquarters Operating Instruction 10-1, *Correspondence Preparation Procedures*, Department of the Air Force, Washington, D.C., September 30, 1987, p. 4.

²For Headquarters USAF, this organization is represented by a lettering system for office symbols that denotes position in the Air Staff hierarchy and the substantive responsibilities of the office. The Chief of Staff's office is denoted by the initials "CC," and below the Chief there are Deputy Chiefs of Staff and Assistant Chief of Staff. Their offices are denoted by two letters (XO, LE, PR, IN, etc.) to indicate the substantive responsibilities of the Deputy Chiefs of Staff. The subordinate offices of the Air

When a case is coordinated, the process usually begins within the four and five letter offices.³ It can involve thirty or more offices over the space of weeks for a given case. The office where the case originates has the authority to select the offices that will be included in the coordination process.⁴

CREATING UNANIMITY

When a case reaches an office, the personnel in that office have two broad options. They can either concur with the proposed release or refuse to concur. The object of the coordination process is to have all relevant offices review the case. It is a way to solicit their views and raise potential problems before the USAF renders a judgment on the matter. As the case moves through the Air Staff, it will compile a record of all the concurrences and nonconcurrences along with all of the objections raised. This record becomes a formal part of the case and will follow the document until it reaches the office of the Chief of Staff or other designated official, but the record of objections does not leave the USAF.

There is a point in the USAF where the record of views on a case must be merged into a unified position. Obviously, cases that raise no serious objections can be resolved much more quickly. It is, however, extremely unusual for a case to sail through the USAF without gen-

Staff are denoted by the addition of letters to these symbols. For example, under the Deputy Chief of Staff for Plans and Operations (XO), there are two "three-letter" directorates: the Directorate of Plans (XOX) and the Directorate of Operations (XOO). Under the Directorate of Plans (XOX), there are four "four-letter" Deputy Directors: Forces (XOXF), Requirements and Analysis (XOXQ), Regional Plans and Policy (XOXX), and Warfighting Concepts Development (XOXW). Under each of these offices, there are "five-letter" offices. For example, under XOXF (Deputy Director for Forces), there are five "five-letter" Divisions: War & Mobilization Planning (XOXFC), and so forth. To take an example from the Deputy Chief of Staff for Programs and Resources (PR), the Programs Office (PRIPP) would fall under the Deputy Chief of Staff for Programs and Resources (PR), the Director for International Programs (PRI), and the Policy Division (PRIP). This office contains weapon systems specialists.

³This procedure is consistent with the rules that govern the behavior of the Air Staff, as expressed in Headquarters Pamphlet 20-1, *The Organizational Doctrine and Procedural Concepts of the Air Staff*, Department of the Air Force, Washington, D.C., September 21, 1984, p. 3: "To be successful, [action officers] coordinate at the lowest level which has enough information to act on the matter."

⁴Headquarters Operating Instruction 10-1, *Correspondence Preparation Procedures*, mandates that the "action officer must coordinate with each staff office that has a functional interest" (p. 5). However, failure to include "cognizant" offices (offices that have responsibilities bearing on the case) can be corrected by other offices. It is perfectly proper for an office in the Air Staff to expand the coordination process by suggesting that the document be coordinated with any additional offices not on the original list. The USAF as a corporate body looks askance if the coordination process does not include all of the appropriate offices.

erating some number of nonconcurrences. Some will be serious and others less so. It is at this point that the objections raised by individual offices are reviewed and nonconcurrences, in some cases, are overruled. In the technology transfer cases, this review occurs in the office of the Vice Chief of Staff in the International Affairs Division (CVAII).

Once all the four and five letter offices in the USAF have concurred (or not concurred, as the case may be), the office where the case began will send the case to its three-letter offices.⁵ If all of the subordinate offices concur, the three-letter office usually will approve the document and then send it out to the other three letter offices for coordination. After the issue has been coordinated at the three-letter level, it will be sent to the two-letter Assistant Chief of Staff for "top line" approval. When all the two letter offices have had a chance to review the case, the document is sent to the Chief of Staff (or sometimes the Vice Chief or Assistant Vice Chief) for final approval. The memorandum that emerges at this point is known formally as the "Air Force position." This process (shown in Fig. 1) can take months just within the Air Force, with delays in some offices running to days or weeks.

The coordination process can vary in each case. The director of the office where the case originates has the authority to decide which offices will be involved. The case manager, in consultation with the director, drafts a coordination sheet (the Staff Summary Sheet) containing a list of all offices that will coordinate on the case. This list is different each time because all cases involve different technologies, weapon systems, and nations.

The fact that the coordination process can vary from case to case leads naturally to questions of "gamesmanship." The "art" of coordination is to involve only those offices that are minimally necessary for attaining approval. Some offices may try to slip a case through the system with minimal coordination. If the coordination process is broadened beyond that minimum, it increases the chances that problems could delay or even kill the issue outright. Of course, valuable insights, expertise, and concerns of other offices (presumably the reason for coordination in the first place) may be lost with such a strategy. Alternatively, an office may widely coordinate a document but

⁵What we have described is the coordination process as it operates within the Air Staff. As the need arises, however, other offices in the USAF, including the various commands and laboratories, are involved in technology transfer cases. Further, Air Force organizations outside HQ USAF have similar coordination processes.

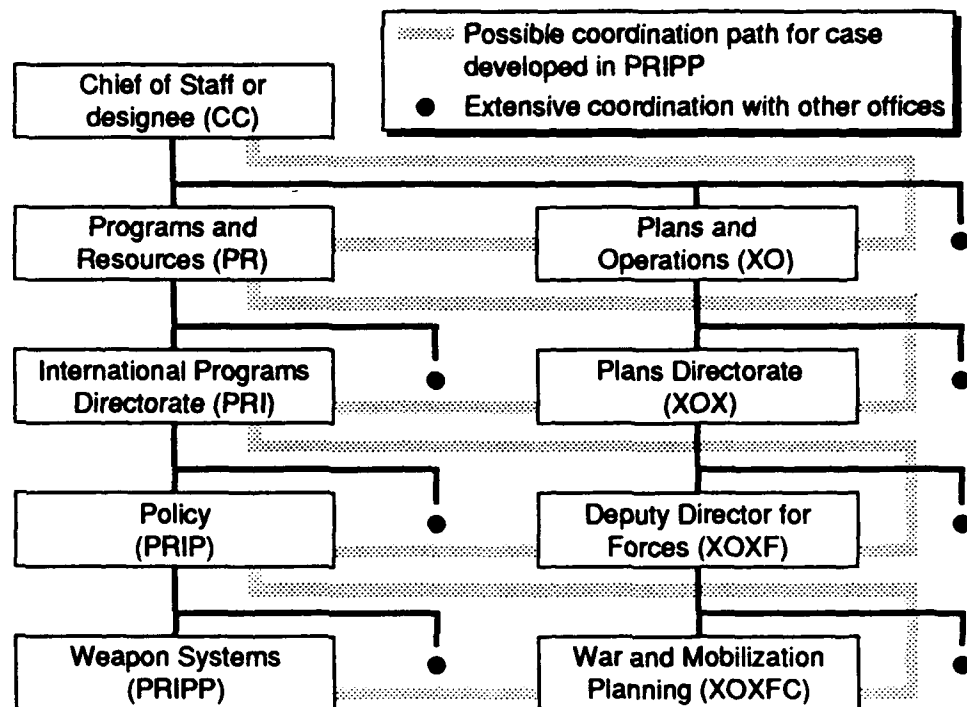


Fig. 1—Headquarters USAF Staff organization and coordination process

essentially self-censor its opinions and recommendations, eliminating much that might be innovative or controversial.

The problem with the process is that it may not produce the best answers. An office trying to complete its work in a timely manner must either eliminate interested parties from the coordination process or produce work that everyone will accept. The Air Force coordination process attempts to achieve a consensus at every level in the chain of command. Under the current system, additional offices can be brought into the decision only at the risk that they will slow or stop the work. Almost any new idea or substantial change will attract objections from some concerned office, again delaying or stopping a decision. The insistence on unanimity both lengthens the process and degrades the quality of the advice provided.

4. PROBLEMS AND IDEAS

The USAF does not use its expertise in technology transfer cases as effectively as it might with existing resources. In this section we identify several problems that weaken the USAF role. We also pose several preliminary ideas that may help the Air Force to resolve these shortcomings.

On one level our intent is to improve the efficiency of the case managers who are charged with coordinating the security assistance cases involving decisions about the transfer of technology. The broader intention, however, is to ensure that USAF expertise is communicated as clearly as possible. This does not imply that we believe our solutions to these vexing problems are full and complete. But the USAF might be better served in its deliberations about technology transfer decisions if it adopts the suggestions outlined below.

DELAYS IN THE COORDINATION PROCESS

Most in the USAF believe that the process of dealing with technology transfer cases is cumbersome and takes an inordinately long time. One explanation is the sheer size of the bureaucracy through which thousands of cases must travel before they are given final approval. This also provides a mechanism for identifying the implications of a case. Furthermore, it gives policymakers more time to formulate a policy. Finally, the lengthy process allows policymakers to exercise the degree of case-by-case review of technology transfer issues that they seem to desire.¹

None of these explanations, however, provides a satisfying reason for the apparent inefficiency of the process. Indeed, the process is rather inefficient not simply because many people are involved, but because it impedes the flow of information through the USAF by requiring the participation of numerous perhaps only marginally interested parties.

A reasonable question is whether many offices in the Air Force really have something relevant to contribute in technology transfer cases. It

¹For example, the Air Force regulations explicitly state that AF/CVAIP, which is the USAF office responsible for Foreign Disclosure Policy, will "Approve on a case-by-case basis the disclosure of classified military information, equipment or training under Air Force jurisdiction or control." Headquarters Operating Instruction 200-3, *Disclosure of Military Information to Foreign Governments and International Organizations*, Department of the Air Force, Washington, D.C., December 16, 1988, p. 1.

is likely that some will have important and useful observations about particular kinds of issues that ought to be aired in the coordination and approval processes. When a large number of offices are asked to participate, however, delays are inevitable. Some will be induced because it takes time to review cases, even if the case is processed immediately. In most cases there will be delays in coordination.

One cannot say in advance which offices should be excluded from the coordination process. To do so would run considerable risks of excluding important substantive judgments. It is important to strike a balance between ensuring that all important judgments are aired and seeing that the process is not paralyzed by delays. Streamlining the coordination process must be done in a way that ensures there is no imbalance between substance and time.

Streamline Coordination Process

One way to improve the system is to change to a coordination process that eliminates purely procedural barriers. One idea might be to incorporate a regrets-only coordination process. A clear deadline for responses is essential. At present, offices that have no interest in an issue and no problems with a proposed case must take the time and trouble to express their agreement. The process can be held up for as long as it takes offices to draft a response, whether they have objections or not. In a regrets-only process, if an office does not respond by the deadline, then it is assumed to have concurred.

We also envision a three-tiered system of responses. On the first level, there is no need for an office to respond if it concurs with or does not have any objections to the proposed technology transfer. On the second level, if an office raises minor concerns or suggestions, the case manager or office director can decide to address or ignore them. Finally, an office can express outright dissent that is serious enough to merit stopping the process until the concern is satisfied or overruled.

We believe that a system permitting offices in the coordination process to respond (or, in the case of a concurrence, not to respond) in one of these categories would have two beneficial effects. First, it would impose deadlines on what is now an open-ended coordination process, expediting the process. Second, providing clearly articulated levels of concern about proposed cases will help policymakers within and outside the Air Force distinguish between minor concerns and serious objections.

These changes in the coordination system for security assistance cases would not exclude anyone currently included in the process. Nor would they diminish the ability of any office in the USAF to make its views known clearly and forcefully. It would, however, remove the burden of having to wait for and subsequently to deal with responses from uninterested offices or those that have only minor suggestions. At the same time, it would not discourage responses that could improve the ways in which a technology is transferred and if necessary provide opportunities to stop a case if the reasons are compelling. This proposed change does nothing to prevent an office from insisting that its concerns are show stopping. In this way, it resembles the current process. But it allows an uninterested party to ignore an issue and an interested party to provide helpful suggestions. Even the show-stopping concerns must be raised before a deadline.

Our research focused on the USAF coordination process in the context of technology transfer. It is possible that these inefficiencies apply to a wide range of issues beyond technology transfer. The coordination process might be imposing costs on a wide array of issues that are handled by the USAF.

INHIBITIONS ON DISSENT

Related to the cumbersome coordination process is its lengthiness. Although many offices in the USAF bureaucracy can be involved in any given case, the real problem is that the USAF spends considerable time collecting views on a case. It then attempts to shape all of the dissenting views on technology transfer issues within the Air Force into a final position that becomes known in the government as the "Air Force position." We believe that the creation of a single position carries an extremely high price.

One cost is that the Air Force does not pass along all the expertise that only it can provide, because some is lost in achieving or imposing unanimity. The basic purpose of the coordination process should not be forgotten. It is a mechanism for raising and refining a variety of views, including dissenting ones, on a technology issue and subsequently bringing those views to the attention of policymakers outside the USAF.² There is no benefit to the nation if the coordination pro-

²USAF regulations, however, expressly state that "internal disagreement should not be disclosed outside the Air Staff." Headquarters Pamphlet 20-1, *The Organizational Doctrine and Procedural Concepts of the Air Staff*, Department of the Air Force, Washington, D.C., September 21, 1984, p. 15.

cess identifies concerns that are not brought to the attention of outside policymakers.

Even when dissent is communicated clearly, there is no guarantee that policymakers will act upon these concerns. More pressing concerns will always prevail over objections raised by the USAF or the other military departments. Any circumstances that weaken USAF ability to articulate the objections or concerns raised in the coordination process detract from its ability to provide advice to policymakers on issues that the USAF alone is in the best position to judge.

There are, however, other costs. If outside policymakers are not able to distinguish between strong and weak Air Force positions, the Air Force's overall persuasiveness is lessened. If the USAF passes along a unanimous position on a case because dissenting views were suppressed during the coordination process, it detracts from USAF ability to provide advice. Those outside the USAF and thus not privy to the objections that were articulated will not have any standard for gauging the nature and seriousness of the objections. This ultimately can create the appearance of unanimity but not the reality. This impairs policymakers' ability to have access to all of the information necessary for sound and balanced decisions.

The USAF may lose political credibility when it suppresses dissenting views. The absence of dissent in the Air Force position does not guarantee that dissent is unimportant or that it should not be brought to the attention of policymakers. Hiding an objection is no guarantee that concerns will remain obscured forever. A more prosaic cost is the time and effort that it takes to create a unanimous Air Force position when case managers have to rework a position before it will be acceptable in the broader Air Force community.

Why does dissent so often fail to pass beyond the USAF to policymakers? One explanation is the nature of the USAF. Like all military organizations, the Air Force is structured to make decisions and ensure that those decisions are carried out. That is the nature of organizations having a high degree of discipline, and it is axiomatic that military organizations need this kind of structure. In the provision of advice to civilian policymakers, however, an extremely rigid organization that treats all issues as command decisions may be dysfunctional.

It is important to distinguish between the *command* responsibilities that the Air Force has for some issues and the *advisory* responsibilities that it has for others. It seems to us that the current coordination process confounds these two roles because virtually all issues

that come before the USAF, including those pertaining to technology transfer, are treated as command decisions. When it provides advice to policymakers, the USAF assumes an advisory role in which a diversity of opinion and a variety of options are extremely valuable. The USAF coordination process, however, eliminates such views and options from consideration.

Ensuring that Dissent Reaches Policymakers

One way to ensure that the broad range of views on proposed technology transfer cases articulated in the USAF are able to reach policymakers is to reform the coordination process itself to maximize the chances that dissenting views will be passed along to policymakers. This should happen in all cases, or at a minimum when a particularly serious objection is raised. This does not mean that even the most trivial objections should be passed along, for this would burden the process with far too much detail. But if serious objections are transmitted to policymakers it will help them to identify and weigh the merits of the objections that are raised in the USAF. One way to ensure that a variety of views are passed along is to build two tiers of "negative" responses into the coordination process, as described earlier.

Another suggestion is to use the "Air Force position" far more sparingly than is current practice, and only in those instances when the issue is sufficiently important by itself or to the USAF. To use it otherwise expends USAF political and bureaucratic capital on less pressing issues. Implicit in these changes is a recognition that the USAF does not have a major institutional stake in all issues that come before it. It is self-defeating if the Air Force provides a unified position along with its military judgment in all situations. The expertise and information often are arranged to support only one option, and as a consequence those outside the Air Force correctly view the "advice" as advocacy. Were the Air Force to provide information, expertise, and analysis about several positions, its advice would carry more weight. And in those important cases when the Air Force has a major institutional stake, taking a position will stand out more clearly in the process. Ideally, the Air Force position should be formulated as a separate document from the case material. In this way, a policymaker might still get a variety of options but will know which option the Air Force strongly endorses. Some procedure would need to be created to determine if an Air Force position is necessary. The decision might be made by the Air Force Chief of Staff, the Vice Chief, or the Assistant Vice Chief.

If the USAF can articulate a broad set of concerns about technology transfer cases, the subtle and tangible benefit will be to increase its credibility and hence its leverage. It will help to shape the views of outside policymakers rather than simply engaging in the more prosaic task of presenting a unified position.

FAILURE TO ANTICIPATE BROADER CONCERNS

One of the consequences of the Air Force coordination process is that USAF case managers often view a coordinated Air Force position as the end of the process, and hence as a success. The reality is that a technology transfer case is not over until policymakers in several government bureaucracies make a decision. The tendency of case managers to focus on the USAF coordination process reinforces the well-established tendency to focus their attention primarily on Air Force issues.

Even if we expect the Air Force to concentrate on the areas in which it has substantial expertise, the failure to consider a wide range of issues causes cases to be stalled or recycled through the USAF because important concerns were not identified. We believe that it is important for USAF personnel to anticipate important problems, because if they do not capture such issues the first time around, time must be spent on reformulating the case at a later date.

Broaden Informal Coordination Process

Individuals in the USAF will be able to anticipate a broader range of concerns in technology transfer cases if they are encouraged to engage in early, informal coordination with offices outside of the Air Force. Case managers will be more likely to identify issues that are not the traditional concerns of the USAF but that can have a profound effect on a case if there are discussions with individuals in the rest of the Department of Defense, the State Department, Commerce Department, and National Security Council staff.

Better Access to Information

The tendency of case managers to focus too narrowly on USAF concerns will diminish if they have access to information tools that identify some of the objections likely to arise in technology transfer issues. An example is the bilateral political issues that exist in all considerations about the willingness to release technologies. Unless USAF personnel can anticipate some of the broad problems, they will be

likely to overlook the concerns that normally weigh very heavily in the minds of policymakers. Not many Air Force officers and civilian personnel have substantive expertise in all the issues that are raised in a technology transfer case. However, one could create instruments (including checklists and other simple informational aids) that would help USAF personnel quickly increase their awareness of important considerations or help them to learn where such information can be found.

The intention is to ensure that USAF personnel from the start address as many as possible of the relevant problems in technology transfer cases and not just those that pertain narrowly to USAF concerns. In the absence of broadly based solutions to such problems, the issue is likely to be stalled either in the USAF or in another bureaucracy until the problem has been resolved, weakening USAF ability to provide timely and balanced assessments to policymakers. At the same time, the USAF will have a better appreciation of the nuances that reduce the chances that a case will be approved. The USAF also will be able to judge when an issue is not worth pursuing and better understand the factors that compel policymakers to ignore USAF recommendations. Finally, if USAF's ability to create more balanced assessments of technology transfer issues is improved, the USAF will provide more effective advice to policymakers.

IDENTIFYING CONTROVERSIAL CASES

The fact that case managers in the USAF perform a large volume of work certainly is problematic, but not simply in the sense that it causes delays or problems. The more important concern is that case managers' efforts are deflected from the cases that merit the most attention. In view of the sheer volume of cases and the inevitable lack of expertise on the part of USAF personnel, the difficult cases are not always identified as early in the process as they might be. When case managers have difficulty identifying these cases, they may spend time on the noncontroversial cases or on the noncontroversial aspects of controversial cases. That time and effort would be better spent on more important problems.

If case managers can isolate the difficult technology transfer cases or the troublesome aspects of a given case as early as possible, their efforts will be more effective because they will focus on the problem cases right from the start. There may be two ways to help USAF personnel manage the workload of technology transfer cases so that they can identify the cases requiring the most effort.

Tools to Identify Controversial Cases

The first issue is mechanical. USAF case managers should routinely have discussions with personnel in CVAII at the beginning of each case.³ CVAII is the office that collects all of the views within the Air Force on technology transfer issues and organizes them into what eventually becomes the Air Force position that is accepted by the Chief of Staff.⁴ By virtue of this responsibility, it has the expertise to advise case managers on many of the basic issues. However, that is not normally how the USAF operates. Although knowledgeable and hence experienced case managers routinely work with CVAII, all case managers do not take advantage of this informal means of coordination. Those who are just learning how the coordination process operates, as well as the experienced case managers, must understand just how useful it is to ask people in CVAII about a proposed technology transfer case.

The second suggestion is to give case managers access to information that helps them to identify the potentially controversial cases. For instance, a checklist of sensitive technologies that are listed in the Missile Technology Control Regime (MTCR) would make case managers aware of the controlled technologies that will make a case highly controversial. A checklist from the Department of Commerce on commercially sensitive technologies would have a similar effect. These and other instruments will make case managers more aware in advance whether a proposed case raises potentially difficult and perhaps unworkable issues. To be forewarned, however, is not the end of the matter. If the USAF decides to proceed with the case, the case managers will be better prepared to make the necessary arguments because they have some understanding of its complexity. If, however, the USAF decides that it is not worthwhile to press the case, or pursues the case but recommends that the item not be released, that decision will have benefitted from the more perceptive advice of case managers.

³In cases involving intelligence or communications security, AF/IN and AF/SCXX perform the same roles as CVAII does in most cases.

⁴The primary function of CVAII, as specified in Headquarters Operating Instruction 11-5, *Responsibilities for Security Assistance*, Department of the Air Force, Washington, D.C., November 14, 1988, p. 4, is to "Develop and coordinate the Air Staff position on the release of classified military information to foreign governments and international organizations."

GENERAL SOLUTIONS

During this research it became apparent that some problems are broader in scope than those outlined earlier and make it more difficult for the USAF to provide the best possible advice to policymakers. We provide several general solutions that may expedite the process, reduce costs, and improve case presentations.

Obtaining Adequate Information

The first problem is that case managers have neither sufficient information nor ready access to all of the information that is relevant to their cases. Each technology transfer case is unique. And in each the devil is in the details. If it is difficult to compile and understand the details in each case, the resulting complications reinforce how important it is for case managers to have substantial technological expertise or ready access to those who do. At present, the information systems that are available to case managers are woefully inadequate.

One solution is to broaden the access of case managers to the information that they need for properly managing these cases. We can imagine, for instance, how useful it would be to have a "precedents" file containing histories of all the technology transfer cases that were approved and rejected for each country and type of end-item. Equally useful items would include checklists of the problems that were encountered in similar cases, files of problems and potential solutions, and lists of offices both inside and outside the USAF that are familiar with specific kinds of problems.

Organizing To Emphasize Technology Not Regions

The second general problem concerns the organization of case managers in the USAF. The present system in AF/PRI organizes case managers into regional divisions. The consequence is that cases are approached as regional rather than technical issues. When case managers are located in a variety of regional offices, technical expertise is effectively dispersed. This arrangement does not take advantage of the technical judgments and expertise that the USAF has to offer. The reality is that the expertise of the USAF is in technologies and operational capabilities and the relationship between the two. At the same time, the offices in PRI cannot hope to compete with the regional expertise that is found elsewhere in the government. There are offices that specialize in regional issues in the USAF, including AF/XOX; in J-5 of the Joint Chiefs of Staff; in the Office of Secretary

of Defense in DSAA, ISA, and ISP; and finally in the State Department and the National Security Council.

One solution is to organize AF/PRI into offices that deal primarily with weapon system technologies. We propose that the regional offices in PRI be transformed into groups of individuals who are specialists in technologies and weapon systems.⁵ This is not to suggest that all of the components that deal with clients should be eliminated. It is desirable to have some group in each division that has the regional expertise necessary for dealing with foreign customers. Some reorganization of AF/PRI, however, would satisfy the need for technical expertise but not at the cost of eliminating all regional expertise.

Many, but certainly not all, solutions to technology transfer issues are implemented on the basis of technical judgments and operational considerations. Even when political forces intercede, however, a more technically oriented USAF position will help to focus the decision process on technical considerations. This is the comparative advantage that the USAF brings to bear on technology transfer cases. There is another benefit for the USAF. If it is organized in a way that provides an institutional setting for relaying its lore and expertise, the USAF will be able to strike a better balance between judgments about the operational implications of the transfers of technology and the array of political concerns that are necessary for dealing with foreign customers.

⁵PRIPP already is organized along these lines. Each of the USAF officers in this office concentrates on one particular technology, so that there is an individual who specializes on aircraft, another on radars, and yet another on missiles, and so forth